

REMARKS

Reconsideration is respectfully requested.

Claims 1-24 are pending in this application. Claims 1-3, 6-10 and 13 are amended. New claims 25 and 26 are added.

The Examiner has objected to the abstract on formal grounds. Applicants have amended the abstract and believe that the objection is now removable.

Claims 1, 15 and 16 are objected to. Applicants have made amendments to the claims to address the Examiner's concerns, and request withdrawal of the objections.

Claims 1, 2, 3, 8, 13 and 14-16 are rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter which applicants regard as the invention. Applicants have amended claims herein with attention to the points of concern the Examiner raised, and respectfully request withdrawal of the rejection.

Claims 1, 3, 4, 8 and 12 are rejected under 35 U.S.C. §102(a) as allegedly being anticipated by Okamoto et al., U.S. 6,144,269. Applicants respectfully traverse.

Okamoto seeks to solve a different problem than the applicants have solved. The applicants have discovered a way to limit eddy currents in an inductor formed on a substrate, including in the device leads. Okamoto does not teach looking to the whole device to enhance performance.

Okamoto discloses in Column 2 lines 34-36, "a noise-cut filter which is able to deal with low frequency noises while assuring a sufficiently large current capacity." The noises Okamoto's device is designed to filter are from semiconductor switching devices from power converters. The frequency range targeted to be filtered by Okamoto is for several KHz to several dozen KHz. See Col 1 lines 21-27. Applicants' device, by contrast, is an inductor element which filters frequencies in the range of 130-14-MHz, a full 4 orders of magnitude faster. Okamoto's device is targeted specifically for low frequency, applications with high current capacity.

Okamoto clearly has not made the same discoveries that applicants have, and Okamoto's disclosure would not help one skilled in the art make applicants' invention. If one looks at Fig. 1(d) of Okamoto, a top coil 3a is shown. The coil winds into through-hole 7 where "it is possible to integrate substrates A and B by soldering using a pin inserted through though-hole 7. Thus the number of coils can be increased by increasing the number of substrates." See col. 7 lines 20-24. The opposite far end of Okamoto's stacked inductor arrangement is terminated by terminal U2. Applicants' device is not stacked inductors. As shown in Okamoto's Fig. 1(d) the coils are wound in the same direction, the current flows in the same direction, and the induced magnetic field is in the same direction. Okamoto discloses two coils connected in series between two terminals. Applicants have one inductor conductor between two terminals and one end of a capacitor element is connected to one side of the

inductor conductor. Claim 1 includes the limitation "the two conductors... are connected with each other at one end wherein one conductor... is an inductor conductor."

In claim 1 applicants claim two conductors on a substrate one apart from the substrate used as an inductor conductor, and the other conductor near the substrate is led out through a gap between the conductor near the substrate and the substrate. The claim is clearly not anticipated by Okamoto. Claims 3, 4 8, and 12 include all the limitations of claim 1 considered allowable. Claims 3, 4, 8 and 12 are also considered allowable.

Claims 2, 13, 17 and 24 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Okamoto et al. U.S. 6,144,269 in view of Mizoguchi et al. U.S. 5,583,474. Applicants respectfully traverse.

Claim 2 recites "three or more metal layers" that are used to form the two conductors and 1 lead wire. This claim highlights an important aspect of the invention, and includes further limitations separating it from the prior art. The invention can be constructed on a very small scale on a substrate such as silicon, using etching and deposition methods such as lithography methods.

Mizoguchi et al. discloses a planar magnetic element with a number of layers in different alternating layer arrangements. The layers comprising magnetic layers and coils shaped conductors layers. According to Mizoguchi et al., when constructed having predetermined cross sectional dimension ratios, specific and desirable characteristics can be achieved. However, Mizoguchi et

al. is different than applicants' invention and would not enable one skilled in the art to make applicants' invention as disclosed or claimed, even if combined with Okamoto.

Fig. 7 and Fig. 24 of Mizoguchi et al. disclose two coil shaped conductors in layers 40a & 40B. Fig. 38 shows one coil 40 sandwiched between magnetic squares 30. Fig. 38 teaches one inductor coil but is absent any teaching of another conductor mounted between it and the substrate. Fig. 7 teaches two inductor coils each with terminations at both ends. It is summarized in Col. 6 lines 46-47 as a transformer arrangement. There is no teaching here to help one arrive at applicants' invention. Mizoguchis' embodiment shown in Fig. 24 is similar to that shown in Okamoto's Fig. 1 (d) which does not render the claims obvious as discussed above.

Okamoto shows a top coil set comprising a stamped metal coil being bonded to a coil made by depositing a conductive paste onto a substrate. The details are not taught by Okamoto but the bond is presumably a continuous one. At a minimum, the bonds are characterized by a plurality of connections along its length as shown schematically in Fig. 5. The bottom coil set is similarly constructed with a continuous bond or connected at a plurality of locations. The bottom coil set and the top coil set interact as spaced apart plates of a capacitor separated by a dielectric sheet.

Applicants connect one conductor which has terminations at both ends and thereby functions as an inductor coil, and another coil which is connected to one side of the inductor and functions

as a single plate of a capacitor. The plate receives charge via its one connection with the inductor coil and functions as a capacitive element in cooperation with the inductor coil.

Conversely the behavior of the inductor coil depends on and is enhanced by the presence of the capacitance element.

In claims 13, 17 and 24 the applicants claim the part of the invention whereupon the inventors have discovered further enhancements possible to the inductive behavior of the top conductor by making adjustments to the opposite end of the capacitance element. Please see applicants' Fig. 13. Claim 13 claims "an end of the other conductor not connected to the inductor conductor is terminated with a predetermined impedance element."

It is respectfully submitted that these claims are neither shown nor suggested by the combination of documents in the rejection, and that therefore claims 2, 13, 17 and 24 are allowable.

Claims 5-7, 9-11 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Okamoto et al. U.S. 6,144,269. Applicants respectfully traverse.

The Examiner alleges it would have been an obvious design choice to utilize different shapes. Applicants respectfully traverse the Examiner's rejection of these claims and point out that the prior art does not show conductors connected as claimed in any shape.

Regarding claim 11 the Examiner states "the applicant admits on page 5, last full paragraph lines 1-3 that it has been know in

the art that when two conductors are made in spiral shapes it is preferable to connect an inner end of one conductor with an outer end of another conductor in order to secure a large inductance." Applicants respectfully take issue with the Examiner's interpretation of this part of the application which reads:

"Moreover, when two conductors are made in spiral shapes, it is preferable to connect an inner end of one conductor with an outer end of another conductor. Since it is experimentally confirmed that it is possible to secure further large inductance when an inductor conductor is formed on a substrate owing to performing such connection, it is possible to realize the inductor element that effectively functions on a substrate."

This wording is in the "Disclosure of the Invention" part of the application. It describes the non-obvious discovery the applicants have made. That when two spiral conductors are connected as described, they provide a larger inductance than one would expect. It is respectfully submitted that therefore, claims 5-7 and 9-11 are neither taught or suggested.

Claims 18-23 are rejected under 35 U.S.C. §103(a) as allegedly being unpatentable over Okamoto et al. U.S. 6,144,269 in view of Mizoguchi et al. U.S. 5,583,474. Applicants respectfully traverse.

The Examiner again alleges it would have been an obvious design choice to utilize different shapes. Again, applicants respectfully note that the prior art does not show conductors connected as claimed in any shape. Therefore, claims 18-23 are

allowable, as the claims are not shown or suggested by the combination.

An information disclosure is submitted herewith citing documents that have been cited in a counterpart foreign application. Applicants note the following with respect to some of these new documents.

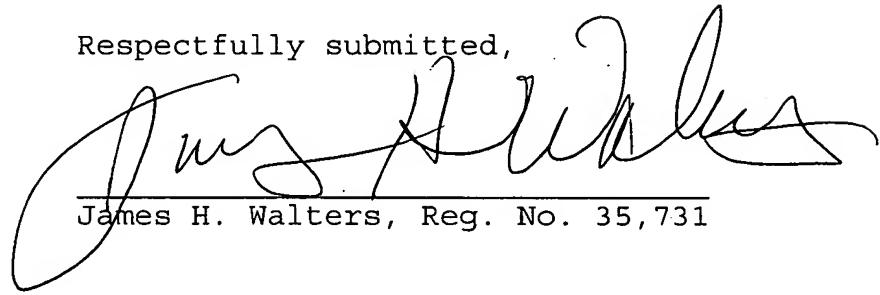
Regarding the document JP 10-208940, applicants note to the Examiner that inspection of the drawings in JP 10-208940 makes it clear the top conductor is never connected to the bottom conductor. The embodiment shown in Figs. 1-4 of JP 10-208940 has a dotted line outline of the bottom coil and a solid line outline of the top coil. The relationship of the coils is shown in cross section in Figs. 3 and 4. Inspection indicates no connection. Similarly the embodiment shown in Figs. 7, 8(a) and 8(b), and the embodiment shown in Figs. 9(a) and 9(b) indicate no connection.

Regarding EP-0-643402, Fig. 3(a) shows two coils, but these are similar to the stacked inductors discussed above. Fig. 9 shows two coils in a transformer configuration.

No amendment made was related to the statutory requirements of patentability unless expressly stated herein. No amendment made was for the purpose of narrowing the scope of any claim, unless applicants have argued herein that such amendment was made to distinguish over a particular reference or combination of references.

In light of the above noted amendments and remarks, this application is believed in condition for allowance and notice thereof is respectfully solicited. The Examiner is asked to contact applicants' attorney at 503-224-0115 if there are any questions.

Respectfully submitted,



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